

CLAIMS:

1. A method for determining an operational condition of a particle detection system, the particle detection system comprising at least one sample inlet for receiving a sample flow from a monitored region, the method comprising the step of:
 - 5 conducting an upstream measurement of a flow rate through the at least one sample inlet.
- 10 2. A method of testing the operation of pollution monitoring equipment, the method comprising the steps of:
 - measuring the upstream flow rate through at least one sampling inlet of a particle detector system;
 - determining an operational condition of the pollution monitoring equipment in accordance with the measured flow rate.
- 15 3. A method as claimed in claim 2 further comprising the steps of:
 - repeating the step of measuring the upstream flow rate after a predetermined time interval;
 - determining the operational condition by comparing respective flow rate measurements.
- 20 4. A method as claimed in claim 3 wherein the predetermined time interval, comprises one or more of:
 - the occurrence of an incident;
 - 25 the occurrence of a maintenance action;
 - regular calendar periods.
5. A method as claimed in claim 3 or 4 wherein:
 - the step of measuring the upstream flow rate, in the first instance, is performed
30 upon one of:

installation;
cleaning and;
repair of the pollution monitoring equipment.

5 6. A method as claimed in any one of claims 2 to 5 wherein the pollution monitoring equipment comprises one or more of:

at least one sampling inlet of an aspirated particle detector system;
a particle detector;
a sampling pipe network of an aspirated particle detector system;
10 a portion of a sampling pipe network of an aspirated particle detector system;
an aspirated particle detector system.

7. A method as claimed in any one of claims 1 to 6 wherein the step of measuring the flow rate is performed using an ultrasonic flow sensor.

15 8. A method as claimed in any one of claims 1 to 7 wherein the step of measuring the flow rate is performed at a point remote from the sampling inlet, at or near ground level.

20 9. A method as claimed in any one of claims 1 to 8 wherein the operational condition comprises one or more of:

a) particle detection system sensitivity;
b) particle detector sensitivity;
c) sampling pipe network obstruction;
25 d) sampling inlet obstruction.

10. 10. Testing apparatus for pollution monitoring equipment of a particle detector system, the apparatus comprising:

30 a flow sensor arrangement adapted to form a sealed fluid communication path between a flow sensor and a sampling inlet of the detector system, wherein the flow

sensor determines the flow rate through the sampling inlet so as to allow a determination of an operating condition of the pollution monitoring equipment.

11. Apparatus as claimed in claim 10 wherein the pollution monitoring
5 equipment comprises one or more of:

- at least one sampling inlet of an aspirated particle detector system;
- a particle detector;
- a sampling pipe network of an aspirated particle detector system;
- a portion of a sampling pipe network of an aspirated particle detector system;
- 10 an aspirated particle detector system.

12. Testing apparatus for testing a particle detector system comprising:
a connector adapted to sealingly engage a sampling inlet of a particle detector
system;

- 15 a sensing device comprising a flow sensor for conducting an upstream measurement of flow through the sampling inlet, wherein the sensing device is operatively connected to a flow data storage;
- an extension means providing sealed fluid communication between the connector and sensing device such that a flow path is formed between the sensing device and the sampling inlet via the connector.

13. Apparatus as claimed in claim 11 wherein the sensing device further comprises comparator means for comparing a measurement of the flow sensor with a pre-recorded flow measurement of the sampling inlet stored in the flow data storage.

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- 14. Apparatus as claimed in claim 12 or 13 further comprising an articulated connection intermediate the connector and extension means for providing relative movement between the connector and extension means.

- 19 -

15. Apparatus as claimed in claim 12 or 13 further comprising an articulated connection intermediate the sensing device and extension means for providing relative movement between the sensing device and extension means.

5 16. Apparatus as claimed in claim 14 or 15 wherein the articulated connection comprises a flexible collar.

17. Apparatus as claimed in any one of claims 10 to 16 wherein the flow sensor comprises an ultrasonic sensor.

10 18. A method of field testing a particle detector system, the method comprising the steps of:

connecting a flow sensing apparatus to a sampling inlet of an air sampling system;

15 measuring the air flow rate into the sampling inlet;

comparing the measured air flow with a previously measured air flow at the time of commissioning the detector system;

determining from the comparative measurements whether a component of the detector system requires maintenance.

20 19. A method as claimed in claim 18 wherein the component of the detector system comprises any one or more of:

at least one sampling inlet of an aspirated particle detector system;

a particle detector;

25 a sampling pipe network of an aspirated particle detector system;

a portion of a sampling pipe network of an aspirated particle detector system;

an aspirated particle detector system.

20. Apparatus adapted to perform one of:

30 a) determine an operational condition of a particle detection system;

- 20 -

b) test the operation of pollution monitoring equipment; or
c) field test a particle detector system, said apparatus comprising:
processor means adapted to operate in accordance with a predetermined
instruction set,

5 said apparatus, in conjunction with said instruction set, being adapted to
perform the method as claimed in any one of claims 1 to 9 or 18 to 19.

21. A computer program product comprising:
a computer usable medium having computer readable program code and
10 computer readable system code embodied on said medium for one of:

a) determine an operational condition of a particle detection system;
b) test the operation of pollution monitoring equipment; or
c) field test a particle detector system, within a data processing system, said
computer program product comprising:

15 computer readable code within said computer usable medium for performing
the method steps of any one of claims 1 to 9 or 18 to 19.

22. Apparatus substantially as herein described.

20 23. A method substantially as herein described.